

Three Girls Get 1972 MSC Exchange Council Scholarships

Present and New Students Honored At Luncheon Here

Students attending college under the sponsorship of the MSC Scholarship Program were guests of the NASA Exchange Council at a luncheon at MSC last week.

Winners of the 4-year scholarships awarded in April were announced as:

Kathleen Brown, daughter of Jean Brown of the Safety, Reliability and Quality Assurance Directorate;

Deborah Norman, daughter of Murray Norman of the Technical Services Division, Center Operations Directorate; and

Patricia Stokes, daughter of Katherine Stokes, Flight Technology Branch, Engineering and Development Directorate.

Deborah and Kathleen plan to enter San Jacinto College, where Deborah will prepare for a career as a physical education teacher and Kathleen will take courses leading to future studies at Texas A&M in the field of marine biology.

Patricia plans to seek a degree in the science field at Austin College; she is considering a career in education or with the space program.

Lee James, son of Mevy James of the Guidance and Control Division, is studying to become a doctor. He is attending Baylor University under a scholarship awarded in 1970.

Nancy Junek has been working in the Molecular Spectra and Structure Laboratory in the Chemistry Department at the University of Houston as an undergraduate research assistant.

She is the daughter of Fred Junek of the Technical Services Division and was awarded her scholarship in 1969. She plans to attend Texas A&M College of Veterinary Medicine after her graduation from the U of H in May 1973.

Two students sponsored by MSC were unable to attend the luncheon: Sharon Guy, who is attending California State College at

(Continued on Page 3)



SCHOLARSHIP LUNCHEON—Winners of the MSC Exchange Council's four-year college scholarships for this year plus some of the students already studying under past scholarships were guests of the Council at a luncheon last week. The group included, from left, Nancy Junek, Kathleen Brown, Lee James, Marilyn Bockting and Bob Bailey of the Council, Patricia Stokes and Deborah Norman. Kathleen, Patricia and Deborah are this year's scholarship winners.

ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



Vol. 11 No. 20

September 1, 1972

New Hart Posters Issued for Apollo 17 Crew Health Program

All those MSC Picnic posters springing up around the center (see page 2) are getting a bit of competition by a new series of placards done by Cartoonist John-

ny Hart for the flight crew health stabilization program.

Hart -- "BC" and "The Wizard of Id" -- turned out a set of six posters when the health-watch

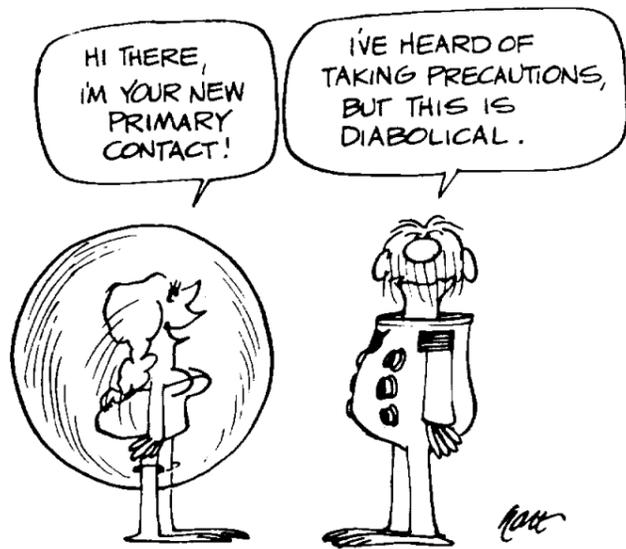
first was established.

Response from personnel here, at Marshall and at Kennedy was so good that program officials asked the artist to continue the series.

Purpose of the posters, and the health stabilization program, is to remind primary and secondary contacts -- those personnel and relatives who come into various degrees of contact with a flight crew -- that crew health is important.

Special emphasis is placed on health during the final few months of flight training.

One of Hart's title characters, the Wizard, also is taking on a new role in the unmanned space program. He is to become to the unmanned program what Snoopy is to manned flight -- a symbol of excellence and awareness in the aerospace industry.



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Last Apollo to Land on Moon 1:55 December 11

The Last Apollo—Apollo 17 is scheduled to touch down on the Moon at 1:55 CST Monday December 11.

Astronauts Gene Cernan, Ron Evans and Jack Schmitt will lift off from Kennedy Space Center at 8:53 in the evening of December 6.

Their goal for that Monday landing is Taurus-Littrow.

Navy Capt. Cernan is spacecraft commander. Evans, a Navy copilot. Civilian Schmitt is lunar

lander, is command module pilot.

Taurus-Littrow, a combination mountainous highlands and lowlands valley region, is an important site in completing the scientific network on the Moon and will offer the opportunity to sample materials from large, steep-sided mountains and dark non-mare material filling the valleys.

The landing point is 20° 10' north and 30° 45' east of the center of the Moon as viewed from Earth.

The first lunar surface expedition is planned to begin at about 5:33 p.m. CST on the 11th. The second and third are scheduled for 4:13 p.m. and 3:33 p.m. CST on December 12 and 13, respectively.

The lunar roving vehicle will be used by Cernan and Schmitt on all three of the seven-hour trips.

The lunar module is scheduled to liftoff the Moon at 4:56 p.m. December 14, and dock with Evans in the Command Service Module at 6:53 p.m.

During the return flight to Earth, Evans will maneuver outside the Apollo spacecraft to retrieve film from the service module experiment bay at about 1:33 p.m. December 17.

Splashdown is planned for 1:24 p.m. on the 19th at 17.9° South Latitude and 166° West Longitude in the Pacific Ocean.

Longest of any of the Apollo flights, total mission duration is planned for 304 hours and 31 minutes.

Petrone Is Joint Flight Director

Dr. Rocco A. Petrone, NASA Apollo program director, has been assigned additional responsibilities as program director of the NASA portion of the US/USSR joint manned space flight mission.

As program director of the Apollo Soyuz Test Project, Petrone will have overall respon-

Monday, September 4, is a legal holiday in observance of Labor Day. All offices will be closed and employees will be excused from duty without charge to leave or loss of pay except those involved in functions considered essential for operations.

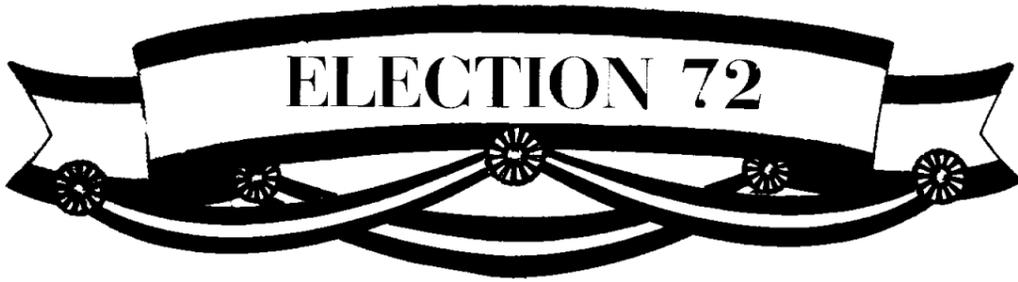
sibility for the direction and management of the United States portion of the joint mission including the spacecraft and docking module activities, flight operations and crew operations at the Manned Spacecraft Center., launch vehicle activities at the Mar-

(Continued on Page 3)

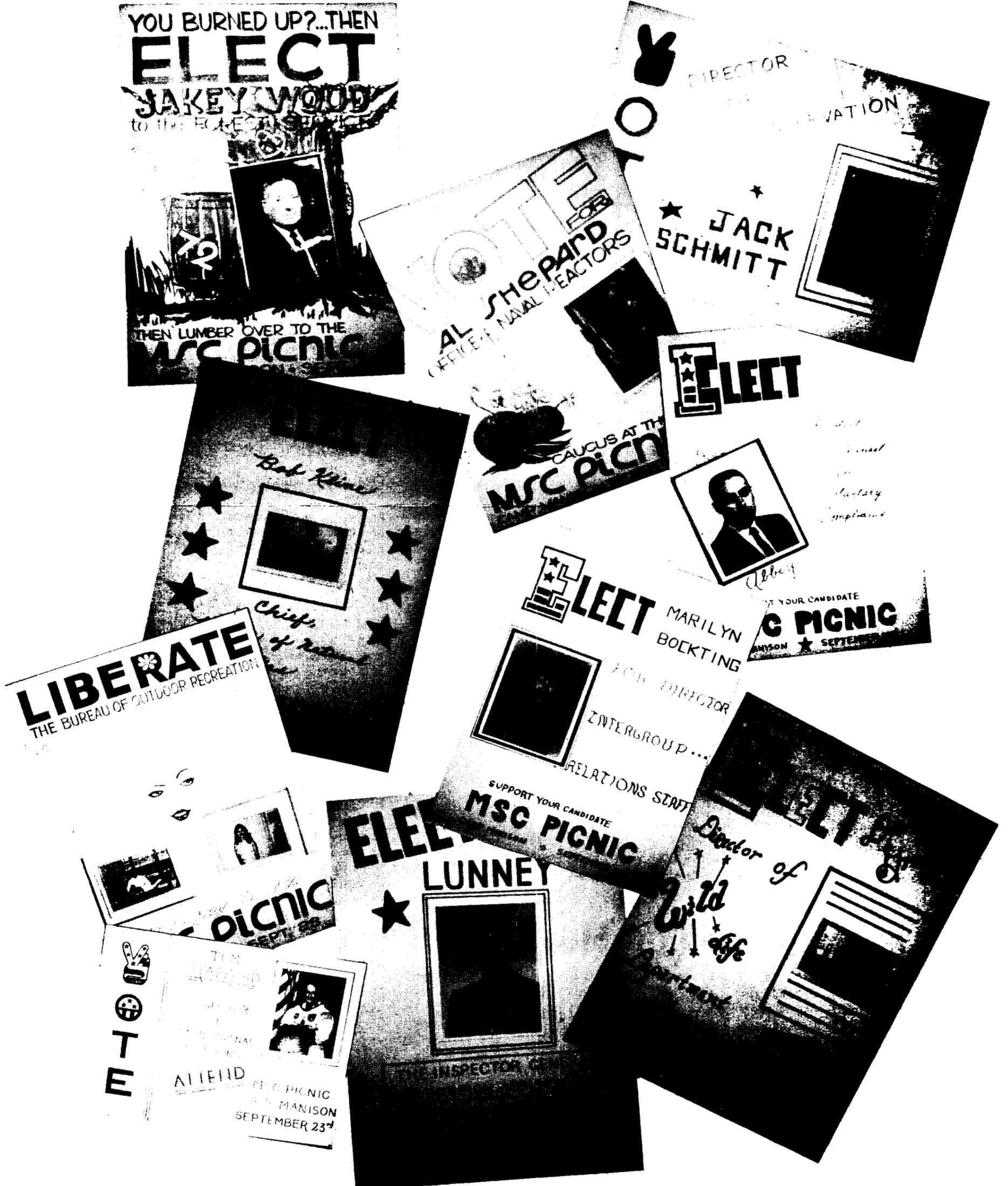
Two Have Served 30 Years, Not 25

Only two people reported the Roundup's short-chancing length-of-service awardees by ten years in the last issue -- "29 Employees Total 800 Years' Service" -- but those two were very sure of their facts. They were Ida Daniel and Joseph DeCorte, both of Safety, Reliability and Quality Assurance and both 30-year award winners rather than 25 as reported.

MSC PICNIC



SEPT. 23



=====
Tickets Available Now From EAA Representatives
 =====

Roundup Swap-Shop

Swap Shop advertising is available to MSC and on-site contractor personnel. Articles or services must be offered as advertised, without regard to race, religion, sex or national origin. Ads should be 20 words or less, including home telephone number. Name and office code must accompany, but need not be included in, ad copy. Typed or printed copy must be received (AP3 Attn: Roundup) by Thursday of the week before publication.

WANTED

Girls 26" bicycle gd cndn. Brenton 488-4372.
Center board for Dolphin Sr. sailboat. Smith 334-3396.
Experienced person to make 2 quilts, full-size tops already completed. Mimi 941-1567 day or 941-0064 nite.
Male Brittany spaniel. Cordes. 469-1003.

LOST & FOUND

Lost pair dark-rim bifocal glasses in or near Bldg 2 Mon morn Aug 14. Baldwin 334-3303.
Found 10-sp'd bicycle, call & describe. Campbell ext 2488 or 488-3635

HOUSEHOLD ARTICLES

42" Magic Chef gas stove white, gd cndn, custom mfd waist-hi oversize broiler \$30. 488-1953.
Foley's Stratorrester reclining chair \$35, studio couch w/ trundle makes dbl bed \$40. 482-1630.
Full-size baby crib w/ gd assortment sheets & blankets \$22.50. Brown 488-0649.
5-pc chrome dinette xint cndn \$25. 734-1435.
1 ladies 24" & 1 mans 26" bicycles both for \$10. Brown 488-0649.
Admiral upright freezer 500 lb capacity \$110. Maj Snyder 483-6381.

PROPERTY & RENTALS

3-2-2 CLC priced below market w/ rugs, drapes, builtins. Vaughn 488-2240 after 5.
CLC 2 bdrm 1 1/2 bath townhouse avail for lease Sep '75 488-3377 after 5.
El Lago wooded quiet street, exquisite 2500 sq ft w/ deluxe features. Flexible financing, lower 40s, by owner 334-2082.
Lg City Highland Ter 3-2-2 1480 sq ft on 74 x 134 lot low equity, assume 7% VA, by owner Willhite 554-4713.
Timbercove 4-2-2 contemp, den, fire, fence, big pines & caks under \$40K. Holley 332-2561 days or 334-2382 nite.
U of H area 5-2-2 cont air, wooded, apt in garage, under \$30,000 for buyer w/ equity. Neely 483-5348.

PETS

AKC reg champion sire'd collie puppies show & pet quality, 3 1/2 mos, permanent shots & wormed 232-1909.
3 female Shetland sheepdogs (mini collie-shepherd) sable color AKC reg gd blood lines \$50 ea. 331-3944.
Unusual pet, beat the Christmas rush, 4' bra constructor incl 10' show case & smaller retaining cage \$70. Rubenstein 334-2354.
Free kittens. Don't miss this super bargain. Louisa 492-2360.
Pug puppies vry gd qual, see to apprec. AKC shots \$75 & up. Mason 488-3514.
2 AKC Irish setter males 7 mo. 333-2328.

BOATS

14' Quacheta aluminum john boat, small wheel trailer both xint cndn 3.5hp trolling motor, best offer. Walker 488-0329.
17' MFG, 55hp Evinrude, big wheel. Sportsman trailer gd shape. Regelbrugge 944-4982.
12' Quacheta Fat-bottom aluminum boat. Haines 941-2495.
Luxurious 16' speedboat 120hp ob, trailer & equip incl pro ski-tow bar, 71 model in mint cndn, reduced to \$2995. Bland 333-4589.
14' Hore Cat, xint cndn, w/ trailer \$1100. Harris 333-2241.
Lido 14 sailboats info on prices & cndn used boats for sale by owners. Hoover 334-2389.
71' Croda 15' trihull w/ vinyl top, 55hp Chrysler galv trailer, Coast Guard equiped, \$500 & take up note. Cordes 469-1003.

MISCELLANEOUS

Clarinet, Selmer Bundy model 1310S, wood tube, xint cndn w/ case \$129. Kuehnel 474-3358.
Remington model 311 calculator under 6 mo old, cost \$279 sell for \$150. Walker 479-7815 after 6.
Fun Football, full set workout gear at most new, pants 32-34, jersey, pads, helmet cost \$90 sell for \$25. Leonard 944-4997.
McIntosh MA230 stereo preamp-amp \$175.

H. H. Scott model 315 stereo tuner \$75, PE model 2020 auto turntable w/ base & dustcover \$50. Snyder 668-5874 before 2pm.
71 World Book \$150 or trade for 70 or newer complete Childcraft. Smaller encyc set \$30 (4 sets in new family). Underhill 482-6122 after 4:30.
Exakta VX 58mm f2.0 Biotar w/ 35mm wide angle 135mm telephoto, pentaprism & waist level viewfinders, filters & leather cases, bargain \$90. Handley 482-7041.
Portable New Home sewing machine w/ attachments, seldom used, like new \$95. 331-4259.
9000 BTU Carrier air conditioner, xint cndn, new compressor, mounting hdwr incl \$90. Teasdale 482-7801.
Four 30 x 58" single-hung aluminum windows w/ screens, matched set \$7 ea or \$25 all. Dorland 488-3258.
Two hvy-dty trailer hitches, frame mount, 1 for 70 Ford Torino wgn, 1 for 70 full-size Ford, \$10 ea. 471-2685.
Pioneer receiver SX-1000TW, two Pioneer CS-33A speakers, all walnut cabinets, xint cndn \$200. Diann Merrell 559-2612 after 5.

Wanted Will trade MSC Picnic tickets for use of tricycles, 12" wheel or larger, for MSC Picnic games. Call Al Jowid, 2463.

Clarinet, Leblanc Normandy 10 used 2 school yrs, vry gd cndn, appraised \$129 sell \$110. Trout 944-3959.
Golf clubs, pro-line MacGregor, 8 irons 4 woods & bag \$50. 481-0628.
Hunting bow 50 lb 62" Wing Thunderbird \$35. Keeton 488-2613.
Precision tools, tool & die-maker type, xint cndn, 946-1869 after 6 daily or weekends.
Black & Decker Dewalt 3" radial-arm saw w/ jigsaw attach \$65. Pratt 479-5152.
Baby bed & mattress. 554-4207.
Couch & matching chair, beige color, enhanced by old age \$25. 488-2713 after 5.
Ventura classical guitar w/ case, new cndn \$50. Saucier 479-4354.
Learn to square dance, lots of fun, classes begin Sept. 5 at Charlton Squares. Information. Kempf 332-3902.
Cornet w/ case & music \$35. Thompson 332-2171.

VEHICLES

68 Pontiac LeMans V8 3 spd 2-dr hdtv xint cndn 38,000 mi. 334-3477 after 4.
72 Olds Cutlass S, 3 mo old, AM/FM, vinyl top, \$4000 firm. 488-2713 after 5.
53 Impala Fordor, 1 owner, 87K mi, first-car cndn, new tires \$500. 488-2713 after 5.
56 Corvette conv, 427, 4-sp'd, new motor & positract, AM/FM. Johnson 945-5656 Texas City.
72 Volvo 144S, air, radio, std, lite blue, sti in warranty \$3400. 626-3826.
69 Chevy Impala cust cpe hdtv, pwr steer & brakes air, viny, top, radio \$1695. Doherty 488-0812.
71 Toyota Corolla Deluxe, radio, air, heat \$1760. 333-2491.
3hp minibike. 554-4207.
73 Plymouth Sport Satellite 9-psgr wgn, xint cndn, must sell, have 73 ordered. Mabry 944-7053.
70 Ford 1/2-ton pickup 360 V6 auto, air, pwr, clean, 8 bed, going into Air Force *****
Group Insurance: Group life & travel accident life, call NEBA, ext 5410. *****

\$2475 XLT Ranger. 733-7657.
Save \$1000 on 17' self-contained travel trailer 1 yr old, xint cndn \$2300 complete. Pratt 479-5152.
57 Chevy, 4-sp'd, Holley 4bbl carb, \$175 or best offer. Luna 485-3533 after 5.
68 Ford F-100 LWB pickup, insulated camper cover, xint cndn, lo mi. Littleton 334-1835.
65 Pontiac GTO very clean & runs well \$650. Bouillion 482-2091 or 482-7642.
72 Chevelle Malibu 350 2-dr hdtv, pwr steer, air, dk green w/ side moulding, 10,000 mi, not a scratch \$3350. Maj Snyder 483-6381.

71 Suzuki 350 w/ 3,000 mi, 2 helmets \$100 equity & assume payments. Luna 485-3533 after 5.
70 Ford Maverick, std, air, radio, 6 cyl \$1450, xint cndn, gd tires. Walker 483-2658.
71 Cutlass Supreme 2-dr hdtv, pwr steer & brakes, air, dk green w/ white top, xint cndn \$3150. Maj Snyder 483-6381.
70 Suzuki TC-90 Trail & Street, xint cndn \$200. Maj Snyder 483-6381.
72 Chevrolet Caprice 4-dr sport sdn all pwr, air, FM, 4,000 mi 4 mos old \$3895. Cobb 333-4109.
69 Buick Wildcat 4-dr hdtv all pwr, air, FM stereo \$2250. Cobb 333-4109.
59 Mercedes 190SL roadster, both tops, xint cndn \$1595. Sampsel 471-0172.
72 Honda CL 450 xint cndn 4,000 mi. Glover 334-2317.
65 VW bus, near-new motor, new battery, clean, gd cndn \$825. Norris 334-1777.
Binneli motor bike 1970 ideal for beginners. Baldwin 334-3303.
70 MGB roadster, wire wheels, AM/FM, tonneau \$1700. Snyder 668-5874 before 2pm.
71 Toyota Mark II 2-dr 4-sp'd, air, protective molding, oversize tires, 9000 mi, warranty \$2395, too small for family. Underhill 482-6122 after 4:30.
71 Capri 60 decor model, 4-sp'd, green, like new radial tires, radio, xint cndn, orig. owner 1995. Schrader 427-3335.
71 International Travelall V8, auto, air, pwr steer & brakes AM/FM, front & rear hitches, trailer brakes. Dyer 488-5259.
72 dunebuggy 2nd-place show-winner \$1400. Misc VW parts—bumpers, wheels, etc — make offer. Nicolson 333-3218.
20' Mobilescout self-contained, air, tandem wheels, sleep 6, 3 yrs old \$3000. 481-4929 after 5.
VW huntingbuggy, xint mech cndn, frnt bumper, engine skid plate \$400. Peacock 354-4458.

LATE ENTRIES

Ham gear, Collins 3253, 75S1 w/ Waters notch filters and Collins c.w. filter, 312B4 station control. 516F2 pwr supply & cab \$1000. Heath Chippewa 2kw linear w/ 4 new 4-400 fins \$200. mint cndn. Lindsey 488-0517.
Two mud tires 8.55x14 4-ply nylon almost new \$15 ea, lawnmower 22" self-propelled w/ 3.5hp B&S eng \$35. Peacock 554-4458.
Exec sec w/ nut desk lk new 39x50 \$125. Nicolson 333-3218.
For rent new Reseda thns 2-2-2 all-elec \$215 mo. Miller 488-0621, after 4:30.
20' Highlander sailboat w/ trailer, gd cndn, 926-7140 after 5.
Alto sax \$100, practice piano gd cndn needs tuning \$125. 334-1768.
70 Triumph TR6, gd tires, xint cndn \$2300. White 488-1024.
65 Mustang 6 cyl auto, air, radio, new battery, gd tires, no rust, yr-old transmission \$550. Proctor 333-3842 after 5.
65 Pontiac Catalina sta wgn 2-st, air, pwr steer & brakes, luggage rack, radio, gd tires, extra c/n \$600. 334-1768.
8' outdoor table umbrella, base & cover \$70 new, lk new \$30. 3 rolls 15 lb tarpaper \$2.50 ea or \$7 all. Nicolson 333-3218.
New Venicelon gypsy wig never worn, orig \$34, sac \$19. 488-0672.
22' AirFlo travel trailer, air, self-contained, xint cndn 70 model \$3000. 488-3377 after 5.
Opportunity: Steady income part or full time. Cosmetics International Corp., unusual product, best training, exciting new marketing techniques. Thompson 946-4927.
Wanted: Apt-size refrig & stove, cheap. Godeke 334-1470.
71 Ford 1/2-ton pickup xint cndn, auto, air, pwr, H. Schneider 426-4749 Highlands.
Bundy alto sax, gd cndn \$125. Herbert 944-3025.
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CG Auxiliary 6 To Hold Course

Coast Guard Auxiliary Division 6 will hold a 12-week course on safe boating beginning Tuesday, September 12, 7:30 - 9:30 p.m., in the Gulfgate Auditorium. Advanced registration is not required, however, it is suggested that you be there a little early the first night for registration. There will be no charge for this course. A manual will be available for those who wish to purchase it at \$4 each.

Martin to Study 'Grasshopper-Leg' Cargo-Handling Device for Shuttle Use

NASA's Manned Spacecraft Center has awarded a \$226,256 contract to Martin Marietta Corporation, Denver Division, to study a system for handling cargo in space.

It will be carried into Earth orbit by a Space Shuttle. Jointed much like the hind legs of a grasshopper, the arly configuration of the system bears a name of attached manipulator system - AMS for short.

The AMS will be electrically operated and designed for single operator use.

It is called attached manipulator because one end is attached to a supporting structure in the

cargo bay of the Space Shuttle. The device will be used to remove space systems such as weather satellites from the Space Shuttle cargo bay and place them in orbit and retrieve satellites from orbit for repair and reuse.

Objective of the study is to design an AMS for dynamic testing and for use in a zero gravity simulation facility to evaluate orbiter cargo and payload handling operations.

The man and the machine in manipulator systems can be so well integrated, the contractor has been told, that the operator "develops a sense of presence, (and) his control and displays are so realistic that he feels he is actually performing the tasks."

Martin Marietta has been awarded a firm-fixed-price-research-and-development type of study contact. The study is to be concluded by January 1.

Present—

(Continued From Page 1)

Long Beach, and Ralph Wilkins, who has withdrawn temporarily from Baylor University due to illness.

Marilyn Beckting, Chairman of the Scholarship Committee, reports that Deborah Carr, daughter of Clifton Carr of the Correspondence Management Section, Center Operations Directorate, has graduated from North Texas State University and is now employed by the Goose Creek Independent School District as a speech therapist.

Tommy Squires, who also received a scholarship in 1968, is entering his fifth year at Lamar State College, studying chemical engineering, and has been working on a part-time basis for Texaco in Port Arthur.

Members of the Exchange Council who hosted the scholarship winners included Exchange Council Chairman Robert J. Bailey, Chris C. Critzco, Roy C. Aldridge, James F. DeMuth, William R. Kelly, William G. Jones, and Richard U. Lea.

Joint Program To Feature EPA Administrator

Major problem areas in environmental protection, and the immediate and long-term goals of the environmental Protection Agency are the topics of an upcoming program sponsored jointly by various NASA-area professional societies.

Featured speaker at the September 21 meeting in the Nassau Bay Holiday Inn will be Arthur W. Busch, administrator of EPA Region 6.

The gathering will start at 6 with a social hour.

Buffet is at 7, and the program begins at 8.

For reservations at \$5 per person, call Jackie Blanchard 488-1270, extension 448.

Petrone—

(Continued From Page 1)

shall Space Flight Center,, and launch operations at Kennedy Space Center.

The command and service module for ASTP will be managed here by the Apollo Spacecraft Program Office under Owen Morris.

Within that office, Dr. Glynn S. Lunney is project director and will act as the chairman of the U.S. working groups responsible for the direct contact with the U.S.S.R. in the establishment of joint project agreements.

The Saturn IB launch vehicle will be managed by the Saturn Program Office, Richard G. Smith, manager, at Marshall.

At KSC, the ATSP will be managed by Robert C. Hook, Apollo Skylab program manager.

Agreement to carry out the joint mission was reached by President Nixon and Soviet Premier Alexi Kosygin in Moscow, May 24. The mission scheduled to be flown in 1975.

In the mission, a Soyuz space craft will be launched by the Soviet Union.

About 7 1/2 hours later an Apollo spacecraft will be launched on a Saturn IB rocket from KSC.

The Apollo orbit will have an inclination of 51.6 degrees to the equator and the Apollo will rendezvous and dock with the Soyuz.

During docked operations, Soviet cosmonauts and U.S. astronauts will visit the spacecraft to the other nation by transferring through a docking module joining the two crafts.

A major purpose of the mission is to demonstrate systems which will permit the docking of any future manned spacecraft of either nation in Earth orbit.

ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS



The Roundup is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

Photographer: A. "Pat" Patnesky

NASA FACTS: TRACKING AND COMMUNICATIONS

Ability to 'Talk' to Instruments, Men in Space Vital

This is another of the NASA Facts brochures prepared to inform the public about activities at the Manned Spacecraft Center and other NASA centers. The Roundup is reprinting it as a piece of general information and interest to MSC personnel and their families.

* * *

The ability to put a multimillion dollar package of scientific instruments into space means nothing if nobody can find and "talk to" the instruments; when men are included in the package, the need for reliable tracking and communication is literally a matter of life or death.

Communication from space might be passive—earth-generated signals bouncing off the metallic skin of Echo satellites, for instance—or active transmissions from radios within the spacecraft.

It can be the one-way flow of information from the space-borne experiments or back-and-forth exchanges between astronauts and flight controllers.

Whatever its nature, the link between Earth and space makes use of a global network of tracking and communications stations.

A companion system utilizes both wireless and cable communications to connect those stations to the appropriate NASA control center.

For manned flight, the control center in charge of the mission is located at the Manned Spacecraft Center.

The tracking and communication system employed is called the Manned Space Flight Network (MSFN).

It and similar network to fol-

low unmanned orbiting satellites and deep space probes are operated by NASA's Goddard Space Flight Center at Greenbelt, Maryland.

So is NASCOM (for NASA communications), which ties those networks to the control centers.

When manned space flight was undertaken, the program's planners wanted capabilities greater than the comparatively simple tracking and data reception of unmanned missions to that time.

Project Mercury's initial needs included: tracking and computing to determine orbital parameters and spacecraft location for normal and aborted missions; at least 4 minutes of voice and telemetry contact between the spacecraft and each ground station, with periods of interruption no longer than 10 minutes; capabilities to initiate reentry or abort from the control center in case the astronaut could not do it; fast and reliable communications between

the ground stations and the control center.

Project Mercury's flight planning called for an orbit path ranging from about 30 degrees south of the Equator, so it was in that belt that the stations were to be established.

Economy, as long as it did not decrease safety, was a major factor in locating the ground stations, so some were positioned to make use of existing facilities such as missile test ranges in the United

States and Australia.

Geography dictated the placement of some sites—electronically fitted ships to provide coverage in the vast ocean areas, for instance.

These considerations, coupled with the fact that Earth's rotation relocates the tracking stations in relation to each spacecraft orbit, brought compromises.

Contact gaps of longer than 10 minutes were necessary on some orbits.

The critical phases of launch and orbit insertion were solidly covered, however, and reentry and splashdown could be tailored to the available coverage.

Configuration of the network today is much the same as conceived for Mercury.

While the face of the network has remained little changed, its workings have undergone extensive modernizing.

The communications link to the ground (down-link) carries information from scientific instruments, data from sensors that monitor spacecraft and astronaut status, tracking signals, and voice communications from the crew; the uplink (from the ground) relays commands to equipment—signals that turn a camera on or off, for example—and handles the talk from the control center to the astronauts.

Originally, MSFN stations used separate radar, telemetry, and command systems, each with its own antenna and radio frequency.

Between the Gemini and Apollo programs, the network was changed to a system called "unified S-band" which combined all the functions on one antenna.

Apollo also required communications powerful enough to reach to the Moon, so three sites with 85-foot antennas for deep space instrumentation were brought into the program.

They are located about 120 degrees apart—at Goldstone in California, Canberra in Australia, and Madrid, Spain.

In Earth orbit, coverage is through 30-foot antennas at the various MSFN stations.

But whatever the means of receiving the data, it still must be relayed to the people who need it.

This is done by NASCOM.

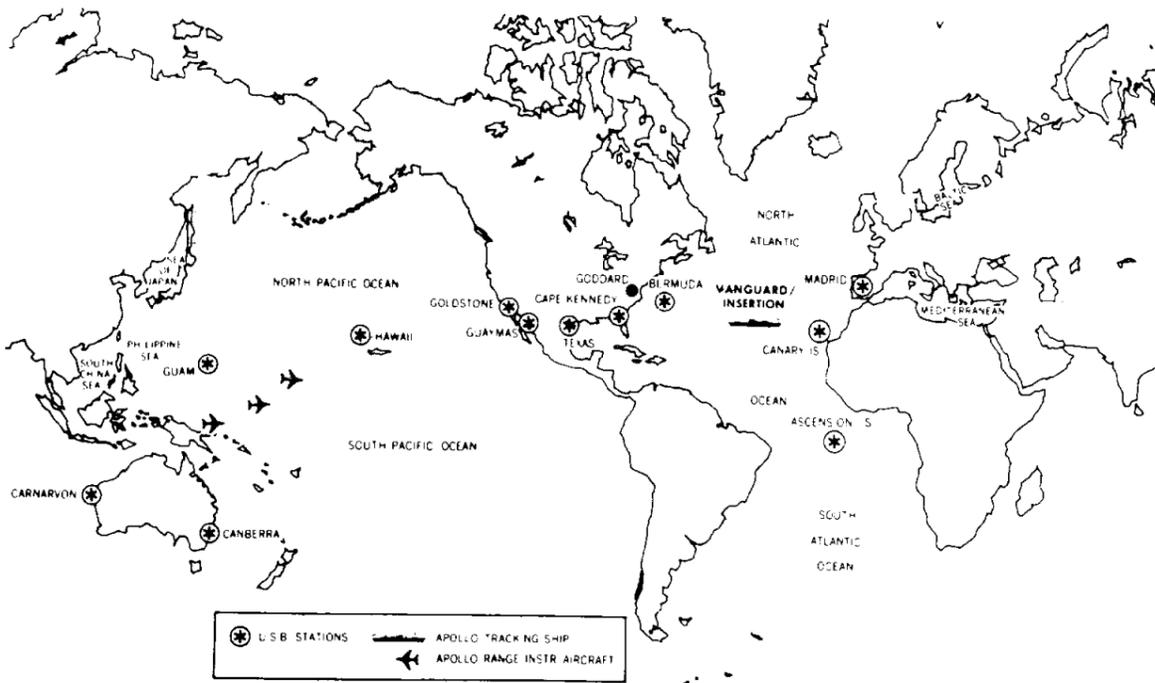
The system uses commercial telephone and telegraph lines, undersea cables, high-frequency radio, and even communications satellites to pass along the information required to make real-time decisions—that is, doing something to influence an event while it is still taking place.

Obviously, data on the event must be available quickly.

* * *

Next issue: The Communicators.

U.S. Government Printing Office 1972-779-577/4



Laser Communications Experiment Uses High-Flying Ellington Plane

Communication by laser beam from the fringes of space is the goal of a two-month-long series of high-altitude aircraft originating here.

With the cooperation of the Manned Spacecraft Center, Marshall Space Flight Center, is testing an experimental communications system, including a helium-neon laser transceiver in the aircraft and an argon laser acquisition and tracking station on the ground.

The tests are being carried out through the use of a WB-57 aircraft operating at 60,000 feet, above 95 per cent of Earth's

atmosphere.

The plane, operated by MSC from Ellington AFB, flies over the ground station located on Redstone Arsenal, Ala., near the Marshall Center.

A trial run described by the experimenters as "highly successful" was run two weeks ago.

Checking out the pulsed laser radar acquisition and ranging system, the experimenters acquired the aircraft and tracked it to 58,500 feet but did not attempt laser communications.

The studies are being carried out for NASA's Office of Aeronautics and Space Technology with most of the equipment developed by Gilfillan, a division of International Telephone and Telegraph Corp., and Chrysler Corp. Space Division, both under contract to MSFC.

Dr. Joseph Randall of MSFC is the principal investigator and Wayne Wagoner is the project manager.

Principal objective of the AVLOC (Airborne Visible Laser Optical Communications) flight tests is to determine the effects of the atmosphere on vertical transmission of laser beams.

The aircraft tests and earlier experiments using balloons are part of an overall NASA program to develop optical communi-

cations systems for operational use in this decade.

A similar visible-light experiment has been planned for the ATS-G satellite, which NASA will launch in 1975.

A laser beam, as any other electromagnetic wave, can be modulated to transmit information.

Its advantage is in its much higher frequency which permits more data to be transmitted during a given period.

Theoretically, up to a million television channels can be broadcast simultaneously over a single laser from space.

Secretaries' New Officers Installed For '72-73 Year

The Clear Lake Chapter of the National Secretaries Association (International) has installed new officers for the 1972-73 term.

Helen Weseman is serving the chapter as president, Carol Jean Smith is vice president, Alma Hurlbert, treasurer, Linnie Patterson, corresponding secretary, and Virginia Thompson, recording secretary.

Jimmie O'Hare, CPS, Karen Kumlacky, and Dixie Thomas are serving as directors.

The Clear Lake Chapter of NSA was chartered in 1969 and has a membership of 27.

NSA membership is open to all secretaries meeting the necessary requirements.

Membership information can be obtained from Lea Bell at Lockheed Electronics, 488-0080 ext. 375.

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